DEQ Nutrient Work Group
23rd Meeting Summary
September 5, 2013

Introductions
A list of the members of the Nutrient Work Group (NWG) and others in attendance or participating in the meeting via telephone is attached below as Appendix 1.

Agenda
The meeting participants reviewed and approved the following agenda items.

- Review of the July 9, 2013 Meeting Summary
- Overview of the July 26, 2013 Briefing to the Board of Environmental Review on Nutrient Criteria and Implementation
- Topics pertaining to Nutrient Criteria
  - Streamlined Site-specific Numeric Nutrient Criteria
  - Adoption of Chlorophyll *a* as a Standard
- Staged Reduction of Nutrients
  - Stages for Mechanical Facilities with a Discharge Larger and Smaller than 1MGD
  - Projected Costs to Meet Staged Reduction
  - WERF's Affordability Process
- Activities Related to Non-degradation and Nutrient Criteria
- Details on Rule Package and Schedule for Rule Package Movement to the BER
- Public Comment
- Next Meeting

Review of the July 9, 2013 Meeting Summary
NWG members present at this meeting had no comments on the July 9, 2013 meeting summary.

Overview of the July 26, 2013 Briefing to the Board of Environmental Review on Nutrient Criteria and Implementation
Because the Board of Environmental Review (BER) has four new members, Mark Bostrom provided a briefing at the July 26, 2013 BER meeting about the history of DEQ's development and implementation of numeric nutrient criteria. DEQ began work on the criteria over ten years ago. Early in this process, DEQ realized that the criteria values supported by science would be low enough to pose implementation challenges. The department has therefore sought several tools to address them. Several pieces of legislation have provided tools, including:

- SB200, passed in 2009, which bans detergents containing phosphorus in counties having water bodies not complying with nutrient or algae water quality standards. To date, only the Clark Fork River basin has such standards and is subject to the ban.
- SB95, passed in 2009, authorized DEQ to issue temporary nutrient criteria and directed it to establish the NWG to advise the department regarding the development and implementation of numeric nutrient standards.
- SB367, passed in 2011, authorized DEQ to develop a general variance to the numeric nutrient standards applicable to a 20-year period.

- HB52, passed in 2011, authorized the BER to adopt rules allowing public sewage systems the option of effluent reuse.

In addition to these statutory tools, the BER has adopted a nutrient trading policy establishing a trading system, and the 319 Program funds and federal Environmental Quality Incentive Program (EQIP) funds have been used for non-point water quality projects.

Question - BER members asked questions about nutrient criteria implementation. Will you be addressing them at the October 4, 2013 BER meeting?
Answer - Yes.

Nutrient Criteria Topics

Mike Suplee discussed the following topics.

Streamlined Site-specific Numeric Nutrient Criteria - At the last NWG meeting, Brian Sugden provided an example of a stream in good environmental health that would not meet the proposed numeric nutrient standards. In response, DEQ has developed a streamlined process for developing site-specific nutrient criteria. Dr. Suplee explained the process using a PowerPoint presentation entitled "Streamlined Process for Developing Site-specific Nutrient Criteria." This presentation is available on the NWG web page at the following address.

http://deq.mt.gov/wqinfo/nutrientworkgroup/AgendasMeetingsPresentations.mcpx

Question - The streamlined process requires a minimum of three years of data collection for key parameters such as nutrients, chlorophyll a, diatoms, and macroinvertebrates. Is this a longer monitoring period than required under the standard assessment methodology?
Answer - Yes, under the standard assessment methodology data must be collected only for one or two years typically, which we view as the minimum requirement. Because we would be creating a new standard, we decided to require a third year of monitoring which is consistent with precedent set in Florida on the same issue. In practice, two years of monitoring data would be usually be available, so the new process only requires one additional year.

Question - What is the definition of "year" for the monitoring requirement? Does it include a minimum number of samples?
Answer - Yes, the minimum number of samples is defined in the assessment methodology. The key is establishing a relatively uniform stream reach to be sampled for the major parameters.

Question - Why base the new criteria on the 80th percentile of the stream's data set?
Answer - Measurements of the nutrients are assumed to vary according to some distribution. Using the 80th percentile allows a 20% exceedance rate, i.e. 20% of the nutrient samples could exceed the new numeric criteria level. (Note: this is already established in the assessment method.) The 80th percentile is selected to assure that the stream reach will pass statistical tests in future monitoring, assuming that the stream reach conditions are unchanged.

Comment - Monitoring during different years would likely cause a different spread of key parameter values.

Response - We chose the 80th percentile because of this fact to ensure that future monitoring data would pass the statistical tests.

Question - Is development of a site specific standard necessarily associated with the triennial review?
Answer - No. Development of a site specific standard could occur at any time, not just during the triennial review.

Question - If we are not linked with the triennial review, would TMDL development be triggered? Triggering TMDL would not be efficient.
Answer - I agree. We need to coordinate the site specific standard development with the TMDL process.

Comment - Allowing less strict criteria in headwaters streams may cause a nutrient hot spot downstream.
Response - This process includes a safety factor. The dataset for reference sites is based on a distribution of median values. Generally, if the site specific criteria value is beyond this median reference distribution but full biological support still occurs, we would apply more complex modeling to develop the criteria rather than using the streamlined approach.

Comment - The new rule should be explicit when the complex modeling approach would be used.
Response - We have good reference sites with good data. We would use the complex modeling when the streamlined site specific approach would result in criteria outside of the pre-defined ranges.

Question - Use of the 80th percentile means that one out of five reference streams would have parameter values higher than the streamlined nutrient criteria. How many of the 20% would have full biological support?
Answer - All of them. We often see very skewed N:P ratios in the reference streams in the upper tail of the distribution. In streams with volcanic geology with high phosphorus values, low levels of nitrogen generally keep algae from blooming.

Question - I am concerned that we would need to go through the streamlined process often. If 20% of the reference streams would be higher than the criteria, what does that say about non-reference sites? Would we expect a 20% impairment rate?
Answer - Probably not. Nitrogen levels are often at very low levels, and the low nitrogen levels would protect biological function.

Comment - DEQ should be upfront with the BOR if the department expects that the streamlined process would be used often.
Response - Fair enough. In a perfect world, site specific criteria would be set for all streams. However, given the actual situation, we have to rely upon reference streams and dose-response studies to set values for ecoregions (i.e., at a landscape scale).

Adoption of Chlorophyll *a* as a Standard - As we discussed at the July NWG meeting, DEQ faces a choice of whether to include the chlorophyll *a* values in Table 12A-1 of the draft of Circular DEQ12 in the standard or leave them in the assessment methodology. In the Clark Fork

River, the values are used in the standard. Including them in the standard would give the chlorophyll *a* values equal weight with the total nitrogen (TN) and total phosphorus (TP) values. Including them in the standard would not affect permits if TN and TP discharge limits were met. Chlorophyll *a* values would not be included in the permit.

Question - In the Middle Rockies ecoregion, could we meet the chlorophyll a values but not the TN and TP values?
Answer - If that occur in specific reaches, then modeling to develop site-specific criteria would be appropriate (the streamlined approach just discussed may also be appropriate). Other factors can affect the nutrients and chlorophyll. For example, in the lower Yellowstone River light limits algae production. Higher TN and TP values (than seen in the Middle Rockies streams) do not result in excess algae problems in the shallow areas.

Question - Would including chlorophyll a values in the standard change monitoring requirements?
Answer - No. In the Clark Fork, the focus of monitoring is on TN and TP and chlorophyll.

Question - To put chlorophyll a values on an equal footing with TN and TP, must they be in the standard to satisfy EPA?
Answer by Tina Laidlaw - If chlorophyll *a* values are not in the standard, then EPA would not allow them in the rule.

Comment - We need a clear statement in the rules that including chlorophyll a values in the standard would not affect permitting.
Response - I am willing to include in the rules a statement to the effect that chlorophyll *a* values would not be incorporated in MPDES permits.

Question - How would integrated criteria be different?
Answer by Tina Laidlaw - EPA has a guidance document that addresses integrated (i.e., aggregate) criteria for nutrients. I will make it available to the NWG. Aggregate criteria would potentially have different causal and response criteria. They would require more documentation, including a downstream analysis. If response indicators are met, the permittee would still have to meet strict TN and TP limits.

Question - Is DEQ willing to explore using integrated criteria in the standard?
Answer - DEQ has done so, and the process we have put together is functionally the same so we prefer our approach.

Question - What is the expense to a permittee for using the streamlined site-specific criteria?
Answer - If only an additional year of monitoring would be required, then the cost would be low, from a few hundreds of dollars up to a thousand dollars for sample analysis. If one is starting from scratch so that three years of monitoring would be needed, the cost would be higher.

Question - If you start from scratch, how much time would be required?
Answer - Three full years of data collection and then whatever time it takes to take it to the BER.

Question - What would kick you into the streamlined site-specific criteria process?

Answer - If a stream reach has full biological support, but higher TN, TP values than the criteria but the TN, TP are still within the reference distribution discussed, then this process would be appropriate.

Question - What are the data requirements to demonstrate full biological support?
Answer - The requirements are set out in the assessment methodology which is available on the DEQ Quality Assurance web page at http://www.deq.mt.gov/wqinfo/qaprogram/sops.mcpx.
Answer by Tina Laidlaw - The requirements for integrated criteria are more complex.

Staged Reduction of Nutrients

Shari Johnson and David Mumford reported on behalf of the League and Cities and Towns on a proposal to stage a reduction of nutrient criteria after 2016 for municipalities with treatment systems that discharge 1 million gallons per day or more and that discharge less than 1 million gallons per day. The League does not yet have a final proposal pending a meeting of its Board of Directors in October. The League will seek to protect the economics of all communities. The decision for communities discharging less than 1 million gallons per day will likely hinge on their understanding of the economic variance.

George Mathieus reviewed the history behind the current statutory nutrient discharge limits. DEQ recognizes a difference in treatment affordability by size category of discharges, and therefore successfully sought to place categories in statute. The discharge limits by category in the current statute through 2016 are: 1 milligram total phosphorus per liter and 10 milligrams total nitrogen per liter for treatment plants with discharges equal or greater than 1 million gallons per day; 2 milligrams total phosphorus per liter and 15 milligrams total nitrogen per liter for plants discharging less than 1 million gallons per day; and hold the line for lagoon systems. DEQ does not believe that having the same discharge limits for the three categories makes sense. Also by statute, a variance for individual communities based on economics and limits of treatment technology is available. DEQ also understands the desire for certainty beyond 2016 and is therefore very interested in a phased approach to criteria after that year that would ratchet down discharge levels assuming affordable treatment is available to support them.

Comment - Tiers are built into the general variance provided in SB367.
Response by George Mathieus - This is correct. The individual variance continues to be available if a tier cannot be met.

Comment - The availability of the individual variance is essential because the economics of water treatment and other necessary services varies substantially among communities.
Response by George Mathieus - The individual variance based on economics and limits of available treatment technology is available by statute.

Comment - DEQ 12 requires satisfying substantial and widespread tests to obtain an individual variance.
Response by George Mathieus - These tests are required by the federal Clean Water Act.

Comment - Too many communities are "cookie-cuttered" into the smaller discharge tier for the general variance tiers. It would be fairer to go back to the straight economics test for the variance. Some small communities can afford to meet the tiers and some can't.
Response by George Mathieus - Individual variances are available by statute. I believe that the tiers for the general variance makes less work for everybody, provide regulatory certainty, and different levels are appropriate for different size communities because of economics.

Comment - Other requirements such as those for ammonia may cause hardships for communities and may drive them over their debt limits.
Response by George Mathieus - This situation is not created by the tiered general variance. The individual variance takes into account costs to communities other than water treatment.

Comment - The tiered approach allows communities to develop plans for three permit cycles after 2016. If an applicable tier is not affordable, the community can apply for an individual variance.

Comment - The limits for each tier are important and deserve additional discussion.

Question - Is the tier approach available to private sector dischargers?
Answer by Mike Suplee - Yes. Also, private dischargers are generally farther down the treatment road than municipal dischargers.

Question - Would the tier levels bind private discharges? If they would then the League should consult with them.
Answer by David Mumford - The League is sharing proposals we are considering with them.

Question - Is DEQ locked into flow based tiers or could you consider basing them on population?
Answer by George Matieus - DEQ wrestled with this, but decided that only flow based limits would work. It was the only practical way to make include the private sector as well.

Comment - Some communities with lagoons may choose not to be proactive in improving discharges.
Response - The ammonia standards will drive lagoon systems to spray irrigation or mechanical treatment.

Projected Costs to Meet Staged Reduction - Jeff Blend discussed this topic using a PowerPoint presentation entitled "Two Information Requests were asked of the Montana Nutrient Work Group." This presentation is available on the NWG web page. Only Dr. Blend's conclusions are reproduced here. They were:

- Almost all towns with a non-lagoon system less than 1 MGD would be able to afford the general variance levels using EPA's 2% Median Household Income (MHI) threshold for existing plus new wastewater costs.
- Most towns with a non-lagoon system greater than 1 MGD would be able to afford the next increment of nutrient treatment beyond general variance levels (WERF 3) using EPA's 2% Median Household Income threshold.

- For non-lagoon systems greater than 1 MGD, out of 12 towns, Hamilton and Livingston would have potential problems meeting WERF Level 3 affordability.
- A majority of towns with non-lagoon systems less than 1 MGD would be able to meet WERF Level 3. Out of 15 towns, four would have costs greater than 2% MHI to meet WERF Level 3, but three of those would be just above 2%.
- Some towns with non-lagoon systems are already meeting WERF Level 2 or WERF Level 3.
- These are estimates only and may both underestimate and overestimate costs

Question - What is the basis of using 2% MHI in your analysis? What if water rates are already above 3%?
Answer - The 2% MHI is the EPA threshold value used in the individual variance test in their Economic Guidance. Only waste water rates were used in this analysis. In the significance test for the individual variance, DEQ modified EPA's number and used a 1% MHI threshold in the individual variance test in order to allow a community to move on in that test. Most smaller non-lagoon towns would be at about 1.5% or lower if they passed an individual variance test and used EPA's sliding scale to figure out how much they had to pay. Some, however, would be over 1.5% if their Secondary score was high.

Comment - Looking only at waste water rates does not reflect reality.

WERF's Affordability Process - Jeff Blend discussed an affordability analysis for utilities to assess compliance with EPA requirements jointly published by the US Conference of Mayors, the American Water Works Association and the Water Environment Federation. The notes used by Dr. Blend are included below in Appendix 2.

Question - The individual variance requires passing a substantial and widespread economic impact test. The substantial test is quantitative. The widespread test is not. How will DEQ objectively evaluate the widespread test?
Answer - We have not yet applied the widespread test, so I don't the answer. The widespread test was adopted by the group preceding this one, the Nutrient Criteria Affordability Advisory Group (NCAAG), and reviewed by this group. The test is based on the EPA guidance with modification and some additional factors proposed by the NCAAG. We tried to develop an objective widespread test but did not succeed.

Question - Is DEQ open to changes to the widespread test questions?
Answer - Yes.

Question - Where was EPA on the widespread test?
Answer - It allowed DEQ latitude to make changes to its guidance.

Question - Can the widespread test be eliminated?
Answer - No as the test requirement is in the federal Clean Water Act.

Activities Related to Non-degradation and Nutrient Criteria

George Mathieus discussed this topic. There is still no silver bullet for addressing non-degradation and nutrients. DEQ is writing a policy addressing application of non-degradation to

new and expanded sources. We will discuss this policy with the NWG. Yesterday, staff from the planning and permitting divisions visited the site of a new mine and had a good discussion with the mine operator. We believe that discussing new projects at the front end will be helpful. We continue to try to add new tools to address non-degradation issues.

Comment - We see a difference between the way that standards and permitting address non-degradation.
Response - The DEQ director is focused on integrating all of the entities dealing with water.

Comment - There is nothing more frustrating that variable interpretations of standards.

Details on Rule Package and Schedule for Rule Package Movement to the BER

Mike Suplee and George Mathieus discussed this topic. Dr. Suplee stated that the following changes have been made to the rule package:

- The definition of limits of technology has been moved from the rules to the guidance document;
- A severability clause is being reviewed by legal staff for inclusion in the rule; and
- Based on the discussion at this meeting, the streamlined site-specific nutrient criteria process will be included in the guidance document; and
- The chlorophyll *a* values in Table 12A-1 will be included in the standard accompanied by a sentence in the rule clarifying that chlorophyll *a* values would not be incorporated in NPDES permits.

Mr. Mathieus stated that his goal is to present a rule package to the BER in December. Prior to the next NWG meeting, DEQ will be working with the League on a phasing and tier level proposal and will discuss it with the industry representatives.

Public Comment

There were no additional public comments.

Next Meeting

The next meeting of the NWG is scheduled for Wednesday, October 16, 2013 from 1:00-5:00 p.m. at a location to be specified.

Appendix 1
NWG Attendance List
September 5, 2013

Members

Mark Lambert	Treasure State Resource Industry Association
Brian Sugden	Plum Creek
Tom Hopgood	Montana Mining Association
Craig Woolerd	City of Bozeman
Michael J. Perrodin	BNSF Railway
Dave Aune	Great West Engineering
Shari Johnson	City of Polson/League of Cities and Towns
Kate Miller	Montana Department of Commerce
Scott Murphey	Morrison Maierle
Chris Brick	Clark Fork Coalition
John Rundquist	City of Helena
Brian Sugden	Plum Creek
John Wilson	City of Whitefish

Alternate Members

Doug Parker	Hydrometrics (alternate for Tom Hopgood)
Bill Mercer	Holland & Hart (alternate for Dave Galt)

Non-Voting Members

Dr. Mike Suplee	DEQ, Water Quality Standards Section, Water Quality Specialist
George Mathieus	DEQ Planning, Prevention and Assistance Division Administrator
Dr. Jeff Bland	DEQ Economist

Other Meeting Participants

Mark Bostrom	DEQ, Water Planning Bureau Chief
Paul Lammers	Revett Minerals
Guy Alsentzer	Upper Missouri Water Keepers
Alan Wendt	AE2S
Abigail St. Lawrence	Montana Association of Realtors
Susan Elayng	Browning, Kaleczyc, Berry & Hoven
Kristi Kline	Montana Rural Water Systems, Inc.
Steve Kilbreath	DEQ, Oil and Gas Coordinator
Todd Teagarden	DEQ, Technical and Financial Services Bureau Chief
Gary Swanson	Robert Peccia and Associates
Tina Laidlaw	EPA
John North	DEQ Attorney
Bob Habeck	DEQ, Water Protection Bureau Chief
Eric Urban	DEQ, Water Quality Standards
Rebecca Bodine	City of Kalispell
Susie Turner	City of Kalispell
Jim Reardon	City of Great Falls
Alec Hansen	Montana League of Cities and Towns

Amanda McInnis	HDR/Montana League of Cities and Towns
David Mumford	City of Billings

NWG Facilitator

Gerald Mueller	Consensus Associates

Appendix 2

The US Conference of Mayors, the American Water Works Association and the Water Environment Federation have published a joint affordability analysis for utilities to assess compliance with EPA requirements. The assertion is that EPA's affordability criteria relies too heavily on median household income and underestimates the effect of rising water bills on low-income, fixed-income, and renter-occupied households. This joint issue brief offers several alternative metrics for better gauging the affordability of water mandates:

- As a percentage of income for potentially vulnerable populations
- Across neighborhoods known to be economically at risk
- Through a variety of other indicators such as the unemployment rate and the percentage of households receiving public assistance

Response: Why we—DEQ—should not change our public affordability process

- This change in affordability analysis is more of an issue to EPA rather than to DEQ. These groups are petitioning EPA and not DEQ.
- DEQ has already changed the 'secondary indicators' from the EPA's 1995 Guidance to include a Low to Medium income measure, the unemployment rate and poverty rate, and a total fees and taxes measure. These economic indicators are mentioned in the document "Assessing the Ability of Federal Water Mandates" as needing to be considered, which we now do (and with Nutrient Work Group consensus).
- It is hard to fail the Substantial Impacts threshold, so that almost all towns go to Significant and Widespread determination.
- The Significant and Widespread impact section of the public affordability allows the community to enter "other factors" they consider significant that are not included in our affordability document, such as the following suggestions from "Assessing the Ability of Federal Water Mandates" such as:
  - Examine the effect of rising water bills across the entire income distribution
  - Average water and wastewater bills can be examined as a percentage of income for potentially vulnerable populations
  - Alternative measures of poverty, such as the Supplemental Poverty Measure (SPM)
  - Debt ceiling limits for communities
  - Long term economic health and trends in communities and households
  - The percentage of households paying a high housing cost
  - households experiencing other types of financial distress
- Measuring all of these poverty measures for an individual variance would place an enormous burden on both communities and regulatory agencies (in our case, DEQ).

- Some of these statistical measures are not available for locations in Montana, especially the rural areas. Projecting future levels of economic well-being is especially difficult for small and rural communities.

    - Data needs mentioned in the document "Assessing the Ability of Federal Water Mandates" include statistics taken primarily from 1) U.S. Census Bureau American Community Survey (ACS), 2) U.S. Census Bureau Integrated Public Use Microdata, Series (IPUMS), and 3) Additional national, state, and local sources. Statistics suggested in the document to be used to determine affordability include Census tract and neighborhood level data, MHI by census tract (ACS), Income quintiles for a community (ACS), Income distribution for a community, Elderly household characteristics , Renter burdens, rents, households receiving public assistance, poverty rates for census tracts, and the Supplemental Poverty measure.

      The ACS estimates are available for some small towns like Winnett and Broadus that are Census Designated Places. The margins of error may be large in some cases where the population of the Census place is small, however. In samples of ACS data for Winnett and Broadus, the margins of error for economic statistics like median household income and household type were very large. PUMS is basically not usable in MT because the areas the PUMS areas incorporate in order to be of sufficient size don't provide workable regions, in terms of available data. The size of a PUMS area is 100,000 persons which creates a problem for measuring anything within small towns. (Mary Craigle, Dept of Commerce). The additional data at the local level could greatly vary.

Conclusion: The US Conference of Mayors, the American Water Works Association and the Water Environment Federation have offered some very useful ideas for better measuring community affordability of water quality standards. The current process used by the Montana DEQ to determine the affordability of meeting water quality standards follows EPA's Interim Economic Guidance and has been significantly changed with input from the Montana Nutrient Work Group (with EPA approval). The current process uses several measures of poverty and income inequality, including some of those suggested in the newly proposed measurements. The current process also allows a community to add other information it deems relevant. Therefore, at this time we will keep our current approach and not use the newly proposed approach offered by the parties mentioned above.